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(54) Trays for use in cooperation with one another

(57) A container or tray, intended for use with a similar container either in base-to-top relationship or, with the upper tray inverted, in top-to-top relationship, has upwardly projecting locating flanges 38,40 at its two pairs of opposite corners which are adapted to co-act when the containers are in top-to-top relationship to prevent lateral separation of the containers. The flanges 40 of one pair of corners are outwardly spaced relative to the other pair 38. The base of the container is also provided with locating flanges adapted to co-act with the upper flanges 38,40 of a similar container when in base-to-top relationship or with the base flanges of another container.

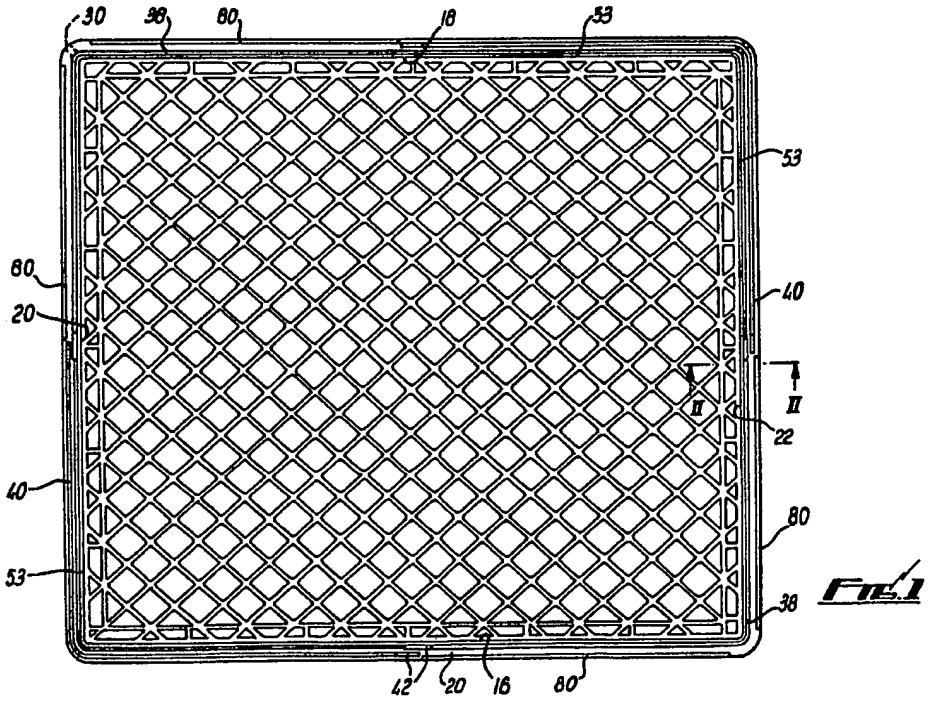

Fig.1

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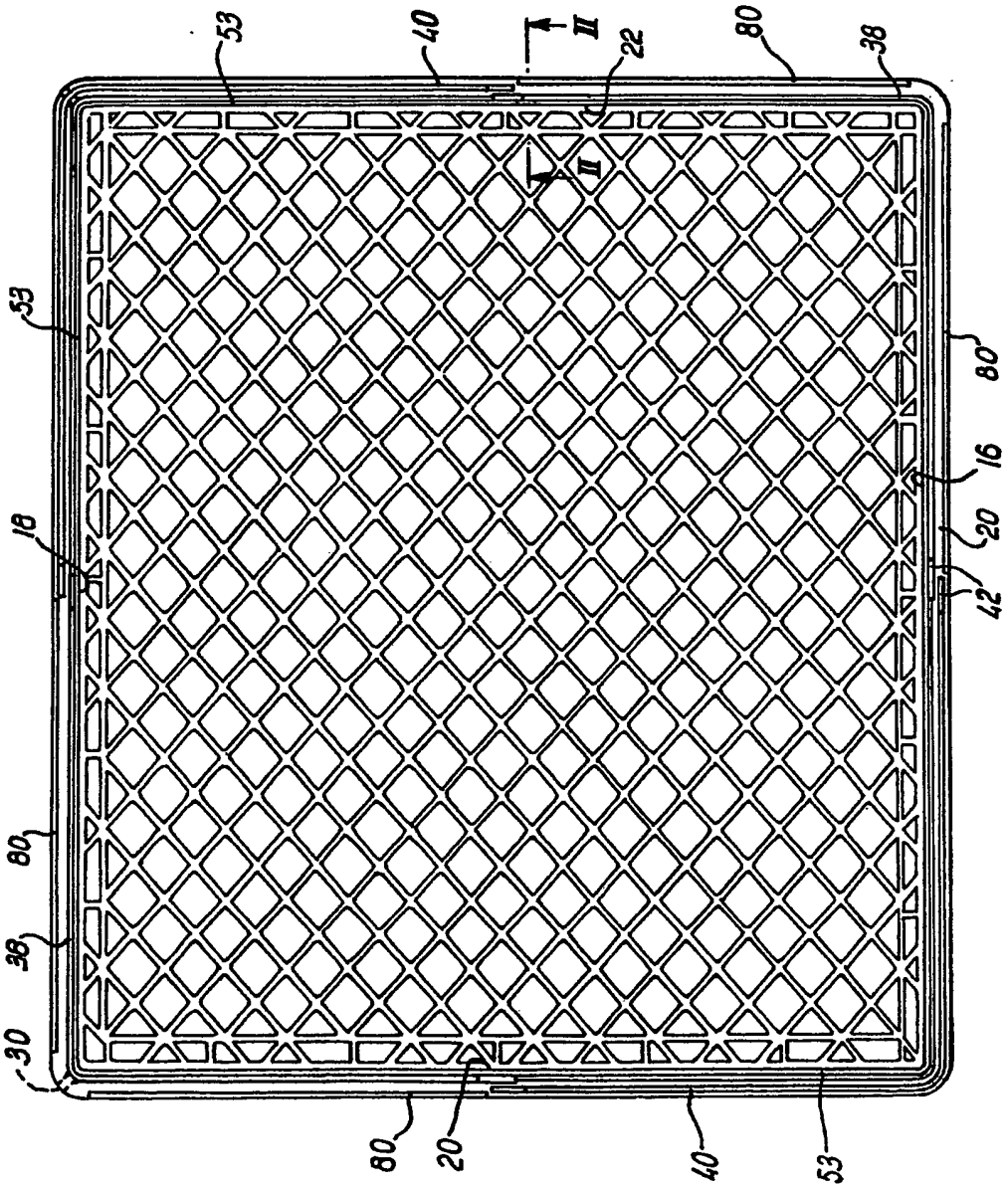
The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy.

Fig.1



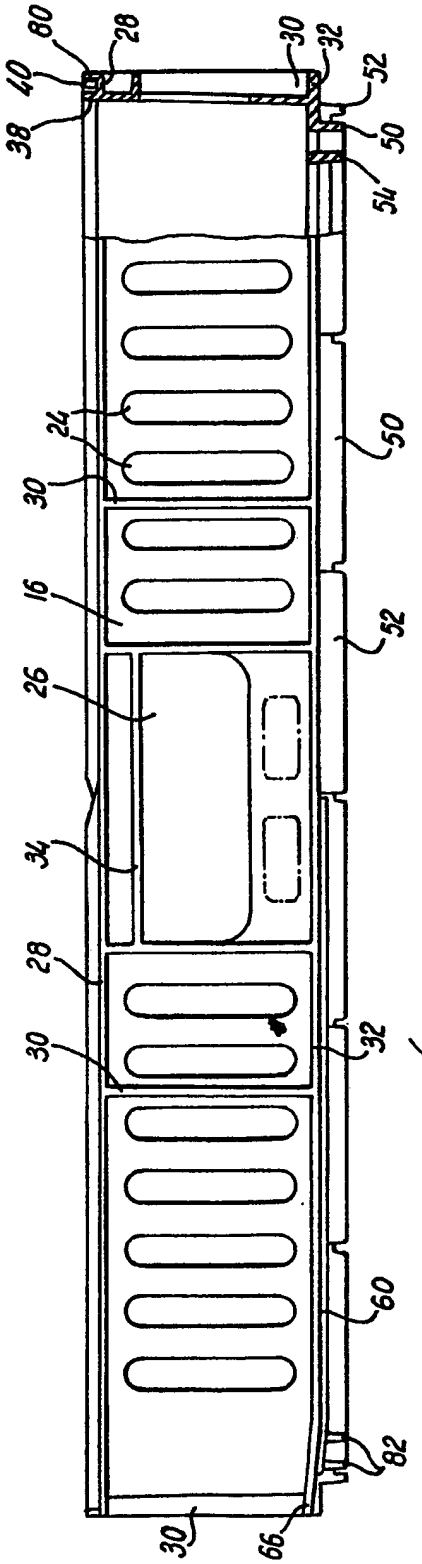


FIG.2

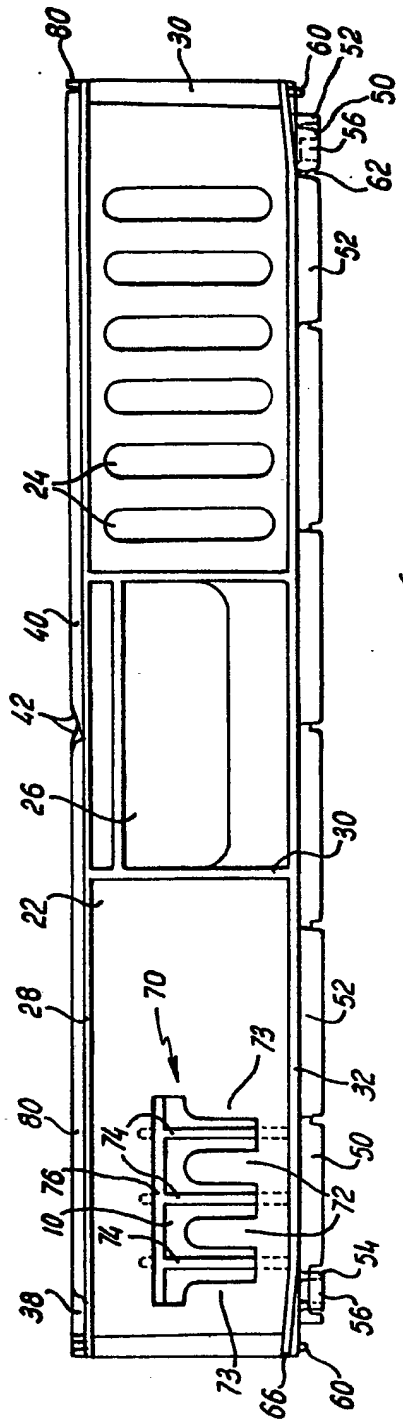
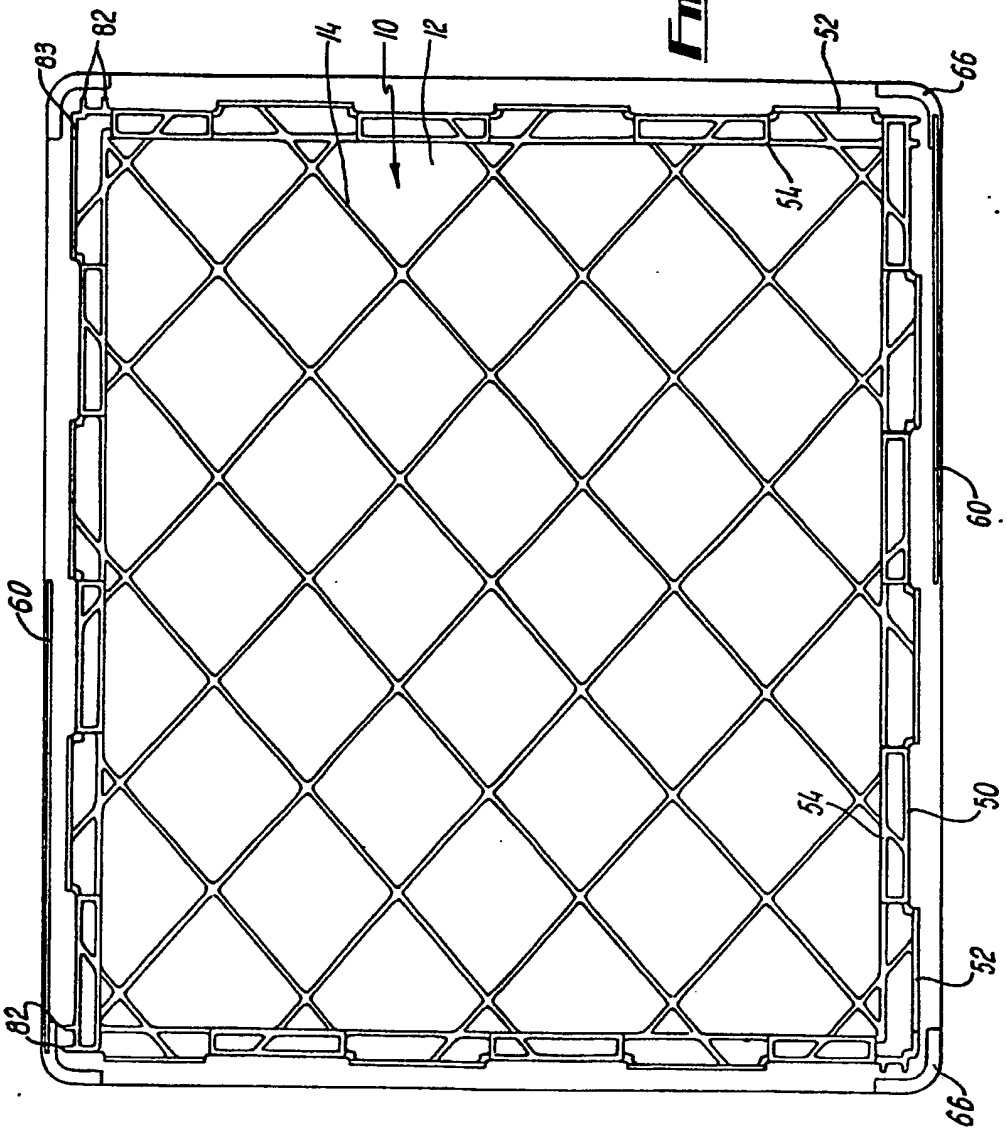


FIG.3

FIG. 4



SPECIFICATION

Improvements in or relating to containers or trays

The present invention concerns improvements in or relating to containers or trays, especially but not exclusively trays which are adapted to be used in pairs with one tray of the pair stacked in an inverted condition on the top of the other tray to define a carrying or storage space in which items having a height greater than the height of the tray can be carried and protected. To enable the trays to be used with articles of normal height it is desirable that they stack one on top of the other in their normal orientation.

According to the present invention there is provided a container comprising a base and four walls upstanding from the base, the walls having flanges projecting upwardly therefrom at or near eachpair of opposed corners each defined by neighbouring walls, the flanges for each corner of the first pair being outwardly spaced with respect to the flanges for each corner of the second pair.

Preferably the upstanding flanges are continuous in that they extend around the corners. Preferably the flanges terminate at or near the mid-point of the wall from which they project.

Preferably the flanges at their point of termination at or near the mid-point of the side taper downwardly towards the wall, the tapered portion of one flange overlapping the tapered portion of a neighbouring flange.

Preferably the height of each flange decreases from the corner towards the mid-point. The angle of decrease is preferably 0.25°.

Preferably an additional flange is provided alongside each inwardly spaced flange with the inner face of said additional flange being spaced outwardly of the outer face of the outwardly spaced flanges. Preferably the additional flange does not exceed continuously around a corner.

The top of each wall may have a substantially transverse ledge from which the flanges project. The ledge may be downwardly chamferred at its inner edge in those regions thereof inside the outwardly spaced flanges.

Preferably the base of the container is apertured. The apertures preferably form a diamond lattice configuration. Preferably strengthening beads are provided on the underside of the base.

Preferably the walls are provided with carrying handles and apertures may be provided in the walls. Strengthening columns may extend between the base and top of the walls.

Preferably at least one of the walls incorporates a ticket or card holder comprising a plurality of resilient free-ended fingers arranged with a transverse spacing relative to corresponding fixed backing pieces against which the card or ticket may rest.

Preferably the base of the tray is provided with downwardly directed locating flanges. Preferably a pair of transversely spaced flanges is provided in association with each side, the flanges taking the form of spaced portions with the spaces between neighbouring portions of one flange being staggered with respect to the spaces between the portions of the other flange.

Preferably the outer faces of the outer flanges from the base lie in a plane inside the plane on which the inner faces of the innermost flanges on the top of lies.

Preferably at each corner there is provided an outer base flange associated with one wall of the container and an inner base flange associated with the neighbouring wall defining that corner. Preferably on each wall of the container the outer base flange extends to or near to the corner at one end of the wall while the other end of the outer base flange terminates a distance from the other end of that wall by a distance approximately equal to the length of the portion of the inner base flange at that corner.

Preferably at each corner each inner base flange is provided with a transverse protrusion on its outer face, the outer end of the protrusion lying on the plane occupied by the outer faces of the outer flange. Preferably the protrusion is formed at or near the end of the inner base flange at the corner. There may be a pluality of spaced protrusions.

Preferably on two opposed sides of the base there are provided downwardly directed guide lips spaced outwardly of the outer flange. Preferably the guide lips terminate at a point immediately below the point at which an additional flange on the top of the container commences.

Preferably the underside of the base at each corner slopes upwardly.

Preferably the portions of each inner base flange are complimented by additional flange portions located inwardly thereof, the additional flange portions being of the same height as the inner flange portions to provide a greater contact area for the base of the tray.

Preferably the depth of the base flanges is greater than the height of the flanges projecting from each wall. Preferably the outer faces of the outer base flange portions lie just within the inside of the wall above it.

Preferably where the container is intended to store cylindrical products the side walls may be deformed inwardly in those regions of the tray between products so that a strengthening rib running from top to bottom of the container may be provided.

Further according to the present invention there is provided a container which is adapted in use to stack on another similar container in base to base relationship, the container having a base, four upstanding sides and downwardly directed locating flanges protruding from its

base, each side of the container having a pair of transversely spaced flanges associated therewith, the flanges being discontinuous with the spaces between the neighbouring portions of one flange being staggered with respect to the spaces between the portions of the other flange.

Still further according to the present invention there is provided a ticket or card holder in a container having a base and four upstanding walls, said holder comprising a plurality of resilient free-ended fingers arranged with a transverse spacing relative to corresponding fixed backing pieces against which the card or ticket may rest.

Preferably the fingers and backing pieces are formed integrally with the wall.

An embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings, in which:–

Figure 1 is a top plan view of a container;

Figure 2 is a front elevation of a container with a part sectional view taken on the line II–II of Fig. 1;

Figure 3 is a side elevation of a container; and

Figure 4 is an underneath plan view of a container.

A container comprises a base 10 provided with a plurality of diamond-shaped apertures 12 forming a lattice structure. Strengthening beads 14 (Fig. 3) extend diagonally across the base at intervals of every three lattice apertures, below the base.

The container is provided with four upstanding walls 16, 18, 20, 22 which are arranged in parallel pairs 16, 18 and 20, 22 with the pair 16, 18 being of greater length than the pair 20, 22. Each wall has elongate vertical apertures 24 and elongate horizontal handle apertures 26 formed therein. Each all terminates in an upper horizontal ledge 28 and strengthening pillars 30 extend vertically down from the underside of the ledge 28 to the upper side of a lower ledge 32 projecting outwardly from the base of each wall. Each corner of the container has an outer strengthening rib 30. Horizontally disposed strengthening ribs 34 are provided at each handle aperture 26.

So that a tray can be stacked on top of a similar tray which the base of the lower tray lowermost and the base of the upper tray uppermost, that is in top-to-top relationship, flanges are formed on the ledges of 28. In the embodiment described a flange is provided for each corner, the flanges 38 associated with one pair of opposed corners defined by neighbouring walls being located on the ledge 28 inwardly of the flanges 40 associated with the other pair of opposed corners.

Each flange extends vertically upwards from the generally horizontally disposed ledge and commences approximately at the mid-point of one side, extends towards the corner parallel to the plane of the side, continues round the corner in an arc and extends parallel to the plane of the neighbouring side to approximately the mid-point of that side where it terminates. Each flange at its end is provided with a downwardly inclined portion 42 merging in with the ledge 28, the inclined portion of one flange overlapping the inclined portion of the adjacent flange which, of course, will be spaced outwardly (or inwardly) thereof. Each flange extends downwardly from a high region at its corner towards its inclined end 42, the angle of the incline being 0.25°.

It will be realised, therefore, that if an inerted container is stacked on a normally orientated container the downwardly directed flanges of the uppermost container will be outwardly and inwardly arranged with respect to the flanges of the lowermost container so that the containers can be stacked one on top of the other with the flanges of the top container lying alongside the flanges of the bottom container to prevent lateral movement of one container relative to the other.

To provide for added lateral stability between sides, an additional flange 80 is provided alongside each inner flange 38. The additional flange 80 is parallel to and is spaced from the inner flange 38 such that its inner face is substantially co-planar with the outer face of the outer flange 40.

The additional flange 80 has a constant width and height along its length, commences at a point spaced from the corner and terminates just short of the mid-point of the wall.

At this stage it will be appreciated that in a modified container the flanges need not extend completely around the corners.

It will be realised that it is advantageous that the containers may be stacked one on top of the other in the same orientation, i.e. base-to-top as opposed to top-to-top as described above. This would not be possible utilising flanges 38, 40 of the type described above located on the base of the box as there would be alignment of the flanges preventing nesting thereof, one within the other.

Thus, an alternative system of flanges has been provided on the base of each box as can best be seen in Figs. 2, 3 and 4. Each side of the base is provided with an inner flange 50 and an outer flange 52. The spacing between the outermost face of the outer flanges 52 on each pair of walls 16, 18: 20, 22 is slightly less than the spacing between the walls below which they are mounted so that with two containers stacked in top-to-base relationship the outer faces of the outer lower flanges 52 abut the inner faces of the walls to locate the containers against lateral displacement. To assist the penetration of the outer base flanges into the top of a container placed below 45° chamfers 53 are provided on the inner edges of the top ledge 28 along-

side the outer flanges.

Provision must be made with the lower flanges 50, 52 to enable base-to-base stacking so that one pair of containers in top-to-base relationship can be stacked on another pair of containers in a similar relationship. Thus each flange 50, 52 comprises three separate portions spaced apart by spaces which are of length substantially equal to the length of the remaining flange portion. The portions of the outer flange 52 are staggered with respect to the portions of the inner flange 50 so that, as can be seen for example in Figs. 2 and 3, when viewing a container from the side as a portion of outer flange terminates a portion of inner flange begins as one moves from one end of a side of the container to the other. It will be noted also from Fig. 2 that at one corner of each side of the box there is either an outer or an inner flange portion, the opposite flange portion being provided at the other end of the particular side. Thus if the containers are stacked in base-to-base relationship an inner flange portion 50 will lie alongside a corresponding outer flange portion 52 and the relationship between the inner and outer flanges will continue in staggered fashion along the side thereby providing lateral location of one container relative to the other.

To provide a relatively rigid base having a reasonable surface area each inner flange 50 has a neighbouring complimentary flange 54 connected thereto by end members 56 so that the flanges 50, 54 with the end members 56 provide stacking feet.

To provide for stability at the corners when the containers are stacked base-to-top transverse protrusions 82 are provided on the outer face of each inner flange 50 at each corner. In the embodiment illustrated two spaced protrusions are provided. The protrusions 82 have the same height as the part of the flange 50 from which they project and each terminates on the plane on which the outer faces of the outer flange portions 52 lie thereby giving "contact" between inner top flanges to outer base flanges from corner to corner on each side of the containers. To accommodate the protrusions 82 when the containers are stacked base-to-base the outer flanges 52 which extend up to a corner have a reduced height portion 83 at the corner.

It is desirable that when the containers are being stacked in top-to-base relationship the upper container can be slid over the top of the lower container until it assumes the correct disposition relative to the lower container. To assist in this relative sliding movement there are provided downwardly projecting guide lips 60 on the underside of the ledges 32 associated with the longer pair of sides 16, 18.

The guide lips 60 must terminate at or near the mid-point of the base side from which they project as they lie in substantially the same plane as the additional flanges 80 on the container top when the containers are stacked base-to-top. Thus on any side of the tray the lip 60 extends along that half of the side where no additional flange is provided on the top of the side.

As a further means to facilitate the sliding movement at each corner the lower ledge 32 and the portion of the lip 60 which it carries is angled upwardly over an end region 66.

Each of the shorter walls 22 of the container are provided with a ticket or card holder, as can be seen in Fig. 3. An aperture 70 is formed in the walls 20, 22 and within the aperture there are provided two upstanding free ended fingers 72 and two fixed end panels 73. It is intended that the card to be carried is trapped behind these fingers and panels and to prevent the card passing through the aperture it is provided with three vertical backing pieces or bars 74 which are located on the inner face of the walls. The backing pieces and fingers are formed integrally with the container walls and a chamferred surface 76 is provided on the wall at the top of the aperture 70.

Various modifications can be made without departing from the scope of the invention. For example many different aperture shapes, sizes and dispositions for the base apertures can be chosen. Additionally there need be no apertures in the sides, whereas in other modifications the sides can have relatively large apertures therein whereby articles can be withdrawn from the containers while they are stacked.

A modified arrangement of upper flanges has been described above and many modified arrangements of lower flanges can be envisaged, for example each lower flange may have more or less than three portions, the minimum being one. It is desirable that the discontinuities between the end of one portion of the outer lower flange and the beginning of the inner portion of the inner lower flange are close together to provide an effectively continuous rail to enable the stacking by sliding operation to proceed smoothly but if the sliding facility is to be sacrificed the portions can be spaced, irregular length portions which must correspond in location and length with a counterpart located diagonally opposite. In a further modification the base flanges can be located on the top of the container and the top flanges on the base but obviously this is less advantageous especially where food products are being carried in the containers as not only would the upper flanges be more prone to damage if they were on the lower side of the box, but the base flanges would provide ideal receptacles for food particles to the detriment of cleanliness.

In a further modification where the intended purposes of the containers is known, that is they have to accommodate rows of cylindrical

objects, for example pies or cans, when the container is loaded there will be regions along each side against which no product will abut, i.e. at the spaces between the cylindrical products. In such cimrcumstances the sides of the container can project inwardly at these points to enable a stiffening rib to be employed.

CLAIMS

1. A container comprising a base and four walls upstanding from the base, the walls having flanges projecting upwardly therefrom at or near each pair of opposed corners defined by neighbouring walls, the flanges for each corner of the first pair being outwardly spaced with respect to the flanges for each corner of the second pair.

2. A container as claimed in claim 1, in which the upstanding flanges are continuous in that they extend around the corners.

3. A container as claimed in claim 1 or claim 2, in which the flanges terminate at or near the mid-point of the wall from which they project.

4. A container as claimed in claim 3, in which the flanges at their point of termination taper downwardly towards the wall, the tapered portion of one flange overlapping the tapered portion of a neighbouring flange.

5. A container as claimed in claim 3 or claim 4, in which the height of each flange decreases from the corner towards the mid-point.

6. A container as claimed in claim 5, in which the angle of decrease is 0.25°.

7. A container as claimed in any one of the preceding claims, in which an additional flange is provided alongside each inwardly spaced flange with the inner face of said additional flange spaced outwardly of the outer face of the outwardly spaced flange.

8. A container as claimed in claim 7, in which the additional flange does not extend continuously around a corner.

9. A container as claimed in any one of the preceding claims, in which the top of each wall has a substantially transverse ledge from which the flanges project.

10. A container as claimed in claim 9, in which the ledge is downwardly chamferred at its inner edge in those regions thereof inside the outwardly spaced flanges.

11. A container as claimed in any one of the preceding claims, in which the base of the container is apertured.

12. A container as claimed in claim 11, in which the apertures form a diamond lattice configuration.

13. A container as claimed in any one of the preceding claims, in which strengthening beads are provided on the underside of the base.

14. A container as claimed in any one of the preceding claims, in which the walls are provided with carrying handles.

15. A container as claimed in any one of the preceding claims, in which apertures are provided in the walls.

16. A container as claimed in any one of the preceding claims, in which strengthening ribs extend between the base and top of the walls.

17. A container as claimed in any one of the preceding claims, in which at least one of the walls incorporates a ticket or card holder comprising a plurality of resilient free-ended fingers arranged with a transverse spacing relative to corresponding fixed backing pieces against which the card or ticket may rest.

18. A container as claimed in any one of the preceding claims, in which the base of the tray is provided with downwardly directed locating flanges.

19. A container as claimed in claim 18, in which a pair of transversely spaced flanges is provided in association with each side, the flanges taking the form of spaced portions with the spaces between neighbouring portions of one flange being staggered with respect to the spaces between the portions of the other flange.

20. A container as claimed in claim 19, in which the outer faces of the outer flanges from the base lie in a plane inside the plane on which the inner faces of the innermost flanges on the top of the container lie.

21. A container as claimed in claim 19 or claim 20, in which at each corner there is provided an outer flange associated with one wall of the container and an inner flange associated with the neighbouring wall defining that corner.

22. A container as claimed in claim 21, in which on each wall of the container the outer flange extends to or near to the corner at one end of the wall while the other end of the outer base flange terminates a distance from the other end of that wall by a distance approximately equal to the length of the portion of the inner flange at that corner.

23. A container as claimed in any one of claims 19 to 22, in which at each corner each inner flange is provided with a transverse protrusion on its outer face, the outer end of the protrusion lying on the plane occupied by the outer faces of the outer flange.

24. A container as claimed in claim 23, in which the protrusion is formed at or near the end of the inner flange at the corner.

25. A container as claimed in claim 23 or claim 24, in which a plurality of spaced protrusion are provided.

26. A container as claimed in any one of claims 19 to 25, in which on two opposed sides of the base there are provided downwardly directed guide lips spaced outwardly of the outer flange.

27. A container as claimed in claim 26, in which the guide lips terminate at a point im-

mediately below the point at which an additional flange on the top of the container commences.

28. A container as claimed in any one of the preceding claims, in which the underside of the base at each corner slopes upwardly.

29. A container as claimed in any one of claims 19 to 28, in which the portions of each inner flange are complimented by additional flange portions located inwardly thereof, the additional flange portions being of the same height as the inner flange portions to provide a greater contact area for the base of the tray.

30. A container as claimed in any one of claims 18 to 29, in which the depth of the base flanges is greater than the height of the flanges projecting upwardly from each wall.

31. A container as claimed in claim 30, in which the outer faces of the outer base flange portions lie just within the inside of the wall above it.

32. A container as claimed in any one of the preceding claims intended to store cylindrical products, in which the side walls are deformed inwardly in those regions of the container which would lie between products placed thereon so that a strengthening rib running from top to bottom of the container is provided.

33. A container which is adapted in use to stack on another similar container in an inverted condition, the container having a base, four upstanding sides and downwardly directed locating flanges protruding from its base, each side of the container having a pair of transversely spaced flanges associated therewith, the flanges being discontinuous with the spaces between the neighbouring portions of one flange being staggered with respect to the spaces between the portions of the other flange.

34. A container substantially as hereinbefore described with reference to the accompanying drawings.

35. A ticket or card holder in a container having a base and four upstanding walls, said holder comprising a plurality of resilient free-ended fingers arranged with a transverse spacing relative to corresponding fixed backing pieces against which the card or ticket may rest.

36. A holder as claimed in claim 34, in which the fingers and backing pieces are formed integrally with the wall.

37. A holder substantially as hereinbefore described with reference to Fig. 2 of the accompanying drawings.

38. Any novel subject matter or combination including novel subject matter disclosed in the foregoing specification or claims and/or shown in the drawings, whether or not within the scope of or relating to the same invention as any of the preceding claims.

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